# Bendy Bones

| **Objective:** | To learn about the importance of getting enough calcium. |
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**Grade Level:** K-4
**Subject(s):** Anatomy
**Prep Time:** Overnight/extended
**Duration:** One class period
**Materials Category:** Special

| National Education Standards | |
|---|---|
| Science | 4a, 7a |
| Mathematics | |
| Technology (ISTE) | |
| Technology (ITEA) | |
| Geography | |

## Materials:

- Chicken Bones
- Vinegar
- Jar with tight sealing tops

## Related Links:

NASAexplores article, "Healing Light"
http://www.nasaexplores.com/lessons/01-028/index.html

NASAexplores article, "I Have The Heart Of A Rocket"
http://www.nasaexplores.com/lessons/01-005/index.html

## Supporting NASAexplores Article(s):

Out-Of-This-World Medical Marvels
http://nasaexplores.com/lessons/02-030/k-4_article.html

# Bending Bones

*Teacher Sheet(s)*

## Pre-lesson Instructions

- Place several chicken bones in vinegar for a few days.

## Background Information

The human body needs calcium for building healthy teeth and bones. Since these parts of the body grow the most during childhood and adolescence, it is especially important for kids to get enough calcium. The more bone mass a child can accumulate during these years, the less likely they are to develop serious bone problems in the future. Children ages 4-8 need 800 milligrams of calcium, while those ages 9-18 need 1,300 milligrams!

Chronic low levels of calcium can cause several health problems including the increased likelihood of broken bones and fractures, unhealthy teeth and gums, and even rickets. In adulthood, these low levels can cause osteoporosis, a painful condition caused by a decrease in bone density. It often leads to broken hips and other fractures in the elderly.

NASA has developed a camera on a computer chip that will help physicians track the onset of osteoporosis—thinning of the bones. By consolidating the various controls onto one chip, the device is small, lightweight, and uses a fraction of energy of multiple-chip cameras currently in use. For patients, this means smaller dosages of radiation and lower cost. NASA initially developed the technology for recording images in space. When NASA developments are adapted for commercial use, they are called spin-offs.

## Guidelines

1. Have students work in groups. Give each group a regular chicken bone that has not been soaked in vinegar.
2. Let the students feel the chicken bone and write some comments about its characteristics on their Student Sheets. Have them draw a picture of the bone and tell how it feels, sounds when tapped on the table, looks, smells, etc.
3. Give each group a chicken bone that has been soaked in vinegar for a few days.
4. Let the students feel the "rubbery" bone and write comments about its characteristics on their Student Sheets. Have them draw a picture of the bone and tell how it feels, sounds when tapped on the table, looks, smells, etc.
5. Have the students compare and contrast the bones. Which one do they think was placed in the vinegar? Why?

## Discussion / Wrap-up

- Explain that the vinegar contains an acid that dissolves the calcium in the chicken bone. Without calcium, bones become weaker and lose their hardness. Would this be good in our bodies?
- Explain to the class that as people age, they may lose the stored calcium in their bodies that helps keep their bones strong and healthy. Their bones become less dense and weaker. We call this problem osteoporosis.
- Explain that NASA developed a camera so small it fits on a computer chip that doctors use to look inside people to check for osteoporosis. NASA used the design to record images in space. We call technology that has been adapted for commercial use spin-offs.
- Read orally with the class the K-4 NASAexplores article, " Out-Of-This-World Medical Marvels."
- Discuss other spin-offs from NASA.

## Extensions

- Have the students draw what they think they would look like without bones. Have them write about how their day would be different without a skeleton. Would they be able to move or go to school?
- Discuss osteoporosis. Have the students create a pamphlet for their school telling their schoolmates why they should drink milk, get plenty of calcium, and exercise.
- Have the students make posters showing their favorite foods that are rich in calcium.

# Bendy Bones

*Student Sheet(s)*

## Materials

- Chicken bone NOT soaked in vinegar
- Chicken bone soaked in vinegar

## Procedure

1. Look at a regular chicken bone that has NOT been soaked in vinegar. Draw a picture of it on page 2 of the Student Sheets. Write about how it feels to the touch, what it sounds like when it's tapped on the table, how it smells, and anything else you notice about the bone.

2. Look at a chicken bone that has been soaked in vinegar. Draw a picture of it. Write about how it feels to the touch, what it sounds like when it's tapped on the table, how it smells, and anything else you notice about the bone.

3. How are the two bones different?

4. If you were looking at the bones without touching them, could you pick out the one soaked in vinegar? Why?

| Regular Chicken Bone | Chicken Bone in Vinegar |
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